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FROM ARKEMA INC. - INTELLECTUAL PROPERTY

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REMARKS

Applicants request entry of the forgoing amendments, consideration of the following remarks and reconsideration of the rejections set forth in the office action mailed October 14, 2005. In that this Amendment and Response is being submitted within three months of the mailing of said Office Action, no additional fees are required.

The disclosure was objected to because the specification did not reflect the correct chain of priority. The specification has been amended to reflect that the present application is a divisional of US Ser. No. 10/253,242 filed September 24, 2002 which is a continuation-in-part of US Ser. No. 10/62,146 filed June 3, 2002.

Claims 13-14 were rejected under 35 USC 102(b) as being anticipated by WO 97/41189 to E.I. DU PONT DE NEMOURS AND COMPANY ("DuPont '189"). Applicants respectfully submit that DuPont '189 fails to anticipate the present invention.

DuPont '189 discloses an azotropic or azeotropic like combinations that comprise 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC-43-10mee), trans-1,2-dichloroethylene, cyclopentane and methanol or 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC-43-10mee), trans-1,2-dichloroethylene and cyclopentane. Applicants respectfully submit that, by definition, azeotrope or azeotrope like combinations exhibit unique properties. With any change in a combination which exhibits azeotropic or azotropic like properties, it is not possible to predict the properties of the changed combination. Thus, a disclosure of an azeotropic or azotropic like combination does not anticipate or render obvious any combination which does not include each of the described components, in the appropriate ratios or concentrations.

The present invention is directed to the discovery that a polyurethane foam which is formed from a blowing agent composition consisting of trans-1,2-dichloroethylene, at least one pentane selected from the group consisting of n-pentane, i-pentane and cyclopentane and optionally water exhibits enhanced fire resistance. Applicants submit that the foam of the present invention does not incorporate HFC-43-10mee as required in the azeotropic or azeotropic like combination of DuPont '189. Applicants further submit that DuPont '189 teaches that a combination of 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC-43-10mee), trans-1,2-dichloroethylene, cyclopentane and methanol or 1,1,1,2,3,4,4,5,5,5-

decafluoropentane (HFC-43-10mee), trans-1,2-dichloroethylene and cyclopentane exhibits unique azeotropic or azeotropic like properties. Applicants submit that the "consisting of" language of the present claims excludes other HFCs such as those required by DuPont '189. DuPont '189 discloses that 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC-43-10mee) can form an azeotropic or azeotropic like combination with trans-1,1-dichloroethylene, cyclopentane with or without methanol. Thus, DuPont '189 teaches that 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC-43-10mee) can have a material effect on the properties of a combination of trans-1,2-dichloroethylene and cyclopentane with or without methanol. The combination of DuPont '189 requires the presence of 1,1,1,2,3,4,4,5,5,5-decafluoropentane (HFC-43-10mee) which is excluded from the present composition. Applicants respectfully submit that DuPont '189 fails to anticipate or render obvious the present invention and that the rejection should be withdrawn.

Claims 15-18 were rejected under 35 USC 103(a) as being unpatentable over DuPont '189 in combination with US 6,288,135 (Bement et al. '135). Applicants submit the Bement et al. '135 neither alone or in combination with DuPont '189 renders obvious the present invention.

Bement et al. '135 discloses an azeotropic like combination of 1,1,1,3,3-pentafluoropropane (245fa), water and at least one hydrocarbon selected from n-pentane, isopentane, cyclopentane and hexane. Applicants submit that such azeotropic like combinations do not render obvious a combination which does not include each and every element of the azeotropic like combination. By definition, azeotropic like combinations exhibit unique properties and the impact of any change in the combination on the azeotropic like properties of the combination cannot be predicted.

Applicants respectfully submit that the "consisting of" language of the present claims excludes those blowing agents materials not expressly claimed. Bement et al. '135 teaches that 245fa can form an azeotropic like combination with water and at least one hydrocarbon selected from n-pentane, isopentane, cyclopentane and hexane. Bement et al. '135 teaches that 245fa can have a material effect on combinations that include water and at least one hydrocarbon selected from n-pentane, isopentane, cyclopentane and hexane. The consisting of language of the present claims excludes 245fa required by Bement et al. '135 and thus Bement et al. '135 alone or in combination with DuPont fails to render obvious the present invention.

Claims 13-18 were rejected under 35 USC 103(a) as being unpatentable over US 5,001,164 (Smits et al. '164) in combination with either one of US 5,607,912 (Samejima et al. '912) or US 5,196,137 (Merchant '137). Applicants submit that Smits et al. '164 and Samejima et al. '912 and Merchant '137, alone or in any combination fail to render obvious the present invention.

Smits et al. '164 discloses closed cell polyisocyanate foams prepared using a blowing agent mixture containing an organic compound having a boiling point above 65° C (a high boiling point component) and another organic compound having a boiling point below 40° C (a low boiling point component). The combination is described as allowing the use of high boiling point components. The preferred combinations include R-11, R-12, R-123 or R-141a as the high boiling point component with 1,1,1 trichloroethane as the low boiling point component. There is no disclosure, either express or implied, of the polyurethane foam incorporating the specific blowing agent combinations of the present invention. Furthermore, there is no disclosure of the impact of the described combinations on fire performance. In addition, the presently claimed combination does not include a component with a boiling point above 65° C as required by Smits et al. '164. The boiling point of trans-1,2-dichloroethylene is only 48° C and pentanes are classified as "low boiling point" materials in Smits et al. '164. Smits et al. '164 teaches a combination that requires a "high boiling point component" that is not present in the present combination. Applicants submit that Smits et al. '164 can not render obvious a combination which does not include a required component of the Smits et al. '164 combination.

The examiner has argued that the isomers of 1,2-dichloroethylene are functional equivalents based upon Smits et al. '164. Applicants respectfully submit that this is not the case. The boiling point of trans-1,2-dichloroethylene is 48° C while the boiling point of cis-1,2-dichloroethylene is 60° C. Thus, the isomers of dichloroethylene are not functional equivalents. In addition, neither isomer of dichloroethylene "qualifies" as a high boiling point component within the definitions of Smits et al. '164.

Merchant '137 teaches the significant distinction between the cis and trans isomers of dichloroethylene.

Merchant '164 teaches that an azeotropic combination of HFC-4310mcc and cis-1,2-dichloroethylene has a boiling point of 37.3° C and comprises 68.2% 4310mcc and 36.8% cis-1,2-dichloroethylene.

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while an azeotropic mixture of 4310mee and trans-1,2-dichloroethylene has a boiling point of 42.3° C and comprises 67.85% 4310mee and 32.15% trans-1,2-dichloroethylene. Clearly the cis and trans isomers are not functional equivalents as evidenced by the differences in physical properties. It is respectfully submitted that a person skilled in the art would not find that the cis and trans isomers are functional equivalents to the extent that substitution of one for the other would obviously provide the same results.

Samejima et al. '912 fails to include any teaching which remedies the "deficiencies" of Smits et al. '164 noted above. Samejima et al. '912, at column 3 includes the isomers of pentane in a "laundry list" of hydrocarbons having boiling points of from 20° to 85° C. There is no disclosure in Samejima et al. '912 of polyurethane foam incorporating the specific blowing agent combinations of the present invention or the surprising impact on fire performance they exhibit.

Applicants submit that in view of the foregoing amendments and comments, claims 13-18 are in condition for allowance and prompt favorable action is solicited.

Respectfully submitted,

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